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EXAMINER	
ALHIJA, SAIF A	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/819,140	KLIMASAUSKAS ET AL.	
	Examiner	Art Unit	
	Saif A. Alhija	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5, 7-12, 14, 16-20, and 40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-12,14,16-20 and 40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *28 June 2001*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *See attached.*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-5, 7-12, 14, 16-20, and 40 have been presented for examination based on the application filed on 27 March 2001.

Priority

2. This application discloses and claims only subject matter disclosed in prior Application No. 09/165,854, filed on 10/02/98, now US Patent no. 6,278,962 and names an inventor or inventors named in the prior application. This application therefore constitutes a continuation or division in accordance to 35 U.S.C. 120 and 37 CFR 1.78. Applicant's desire to obtain the benefit of the filing date of the prior application has been granted.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 28 June 2001 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the Examiner has considered the IDS as to the merits. See attached PTO-1449.

Abstract Objection

4. The abstract of the disclosure is objected to because it is longer than 150 words. Correction is required. See MPEP § 608.01(b).

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

A) Figure 2 contains reference to element 101 that is not in the description of figures.

B) Figure 3 contains reference to element 135 that is not in the description of figures.

C) Figure 4 contains reference to elements 101, 102, and 103 that are not in the description of figures.

D) Figure 11 contains reference to element 304 that is not in the description of figures.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specifications

6. Applicant is required to update the patent number of the reference incorporated on page 3, paragraph 38, entitled "Apparatus and Method for Selecting a Working Data Set for Model Development" U.S. Patent # 5,809,490.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. **Claims 1-5, 7-12, 14, 16-20, and 40 are rejected** under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11, 13, and 15-19 of U.S. Patent No. 5,877,954 in view of **Grayson et al. "Process Control Using Neural Network" U.S. Patent # 5,111,531 hereafter referred to as "Grayson."**

U.S. Patent No. 5,877,954	Application
Claim 1: an apparatus for modeling a process, said process having one or more disturbance variables as process input conditions, one or more corresponding manipulated variables as process control conditions, and one or more corresponding controlled variables as process output conditions, said apparatus comprising: a data derived primary analyzer adapted to sample an input vector spanning one or more of said disturbance variables and manipulated variables, said data derived primary analyzer generating	**Claim 1:** An apparatus for modeling a process, said process includes one or more disturbance variables as process input conditions, one or more corresponding manipulated variables as process control conditions, and one or more corresponding controlled variables process output conditions, said apparatus comprising: A primary analyzer for generating a set of outputs using a first set of disturbance variables, manipulated variables, and controlled variables as inputs to a **curve-fitting algorithm.**

an output based on said input vector; **a derivative calculator for computing a derivative of the output of said primary analyzer;** **an integrator coupled to the output of said derivative calculator for generating a predicted value;** an error correction analyzer adapted to sample said input vector, said error correction analyzer estimating a residual between said data derived primary analyzer output and said controlled variables; and an adder coupled to the output of said data derived primary analyzer and said error correction analyzer, said adder summing the output of said primary and error correction analyzers to estimate said controlled variables.	An error correction analyzer, coupled to said primary analyzer, for generating a set of error correction variables using said set of outputs from said primary analyzer and a second set of disturbance variables, manipulated variables, and controlled variables as inputs; and An adder, coupled to said primary analyzer and said error correction analyzer, for generating a set of control variables for modeling said process by summing said set of outputs from said primary analyzer and said set of error correction variables from said error correction analyzer.
Claim 2: the apparatus of claim 1, wherein said **data derived** primary analyzer and said error correction analyzer sample said	**Claim 2:** the apparatus of claim 1, wherein said primary analyzer samples said first set of disturbance variables, manipulated

input vector continuously.	variables, and controlled variables continuously.
Claim 3: the apparatus of claim 1, wherein said **data derived** primary analyzer and said error correction analyzer sample said **input vector** using predetermined delay periods.	**Claim 3:** the apparatus of claim 1, wherein said primary analyzer samples said set of disturbance variables, manipulated variables, and controlled variables in predetermined delay periods.
Claim 4: the apparatus of claim 3, wherein said delay period is determined using an adaptive process.	**Claim 4:** the apparatus of claim 3, wherein said predetermined delay periods are determined by an adaptive process.
Claim 5: the apparatus of claim 3, wherein said delay period is user selectable.	**Claim 5:** the apparatus of claim 3, wherein said predetermined delay periods are user selectable.
Claim 6: the apparatus of claim 1, wherein said disturbance and manipulated variables are latent variables.	**Claim 7:** the apparatus of claim 1, wherein said disturbance variables and said manipulated variables are latent variables.
Claim 7: the apparatus of claim 1, wherein said data derived primary analyzer is a linear model.	**Claim 8:** the apparatus of claim 1, wherein said **curve fitting algorithm** is based on a linear model.
Claim 8: the apparatus of claim 7, wherein said linear model is a Partial Least Squares model.	**Claim 9:** the apparatus of claim 8, wherein said linear model is a Partial Least Squares model.

Claim 9: the apparatus of claim 8, further comprising a filter coupled to the output of said data derived primary analyzer, **said filter receiving said output vector and** providing a filtered vector as an output.	**Claim 10:** the apparatus of claim 9, wherein said apparatus further includes a filter coupled to said primary analyzer for providing a filtered vector as an output.
Claim 10: the apparatus of claim 9, wherein said filter is adaptive.	**Claim 11:** the apparatus of claim 10, wherein said filter is adaptive.
Claim 11: the apparatus of claim 9, wherein said filter is a Kalman filter adapted to receive said controlled variables.	**Claim 12**: the apparatus of claim 10, wherein said filter is a Kalman filter adapted to receive said controlled variables.
Claim 13: the apparatus of claim 8, wherein said error correction analyzer is a neural network.	**Claim 14**: the apparatus of claim 9, wherein said error correction analyzer is a neural network.
Claim 15: the apparatus of claim 13, further comprising a filter coupled to the input of said data derived primary analyzer, **said filter receiving said input vector and providing a filtered vector for capturing dynamics of the process to the input of said neural network.**	**Claim 16: t**he apparatus of claim 14, wherein said apparatus further includes a filter coupled to an input of said primary analyzer
Claim 16: the apparatus of claim 8,	**Claim 17: t**he apparatus of claim 9,

wherein said error correction analyzer is a neural network partial least squares model.	wherein said error correction analyzer is based on a neural network partial least squares model.
Claim 17: the apparatus of claim 1, further comprising: a distributed control system coupled to the output of said adder; and a run-time delay and variable selector coupled to the output of said distributed control system, **said run time delay and variable selector generating said input vector.**	**Claim 18: t**he apparatus of claim 1, wherein said apparatus further includes: a distributed control system coupled to the output of said adder; and a run-time delay and variable selector coupled to the output of said distributed control system.
Claim 18: the apparatus of claim 17, wherein said run-time delay and variable selector are adapted to receive delay and variable settings, wherein said **data derived** primary analyzer and said error correction analyzer are adapted to receive model parameters, said apparatus further comprising: a data repository for storing historical values of said disturbance	**Claim 19:** the apparatus of claim 18, wherein said run-time delay and variable selector are adapted to receive delay and variable settings, wherein said primary analyzer and said error correction analyzer are adapted to receive model parameters, said apparatus further comprising: a data repository for storing historical values of said disturbance variables, said manipulated variables and

variables, said manipulated variables and said controlled variables; a development delay and variable selector coupled to said data repository for selecting and time-shifting one or more of said disturbance variables, said manipulated variables and said controlled variables, said development delay and variable selector generating said delay and variable settings; a hybrid development analyzer coupled to said development delay and variable selector, said hybrid development analyzer generating said model parameters.	said controlled variables; a development delay and variable selector coupled to said data repository for selecting and time-shifting one or more of said disturbance variables, said manipulated variables and said controlled variables, said development delay and variable selector generating said delay and variable settings; a hybrid development analyzer coupled to said development delay and variable selector, said hybrid development analyzer generating said model parameters.
Claim 19: The apparatus of claim 17, wherein said hybrid development analyzer further comprises: a development primary analyzer coupled to said data repository, said development primary analyzer adapted to sample a development input vector spanning one or more of said disturbance	**Claim 20:** The apparatus of claim 18, wherein said hybrid development analyzer further comprises: a development primary analyzer coupled to said data repository, said development primary analyzer adapted to sample a development input vector spanning one or more of said disturbance

variables and manipulated variables, said development primary analyzer adapted to sample one or more controlled variables, said development primary analyzer generating an output based on said input vector;	variables and manipulated variables, said development primary analyzer adapted to sample one or more controlled variables, said development primary analyzer generating an output based on said input vector;
a subtractor coupled to said data repository and to said development primary analyzer, said subtractor adapted to receive one or more controlled variables from said data repository, said subtractor generating a primary model error output;	a subtractor coupled to said data repository and to said development primary analyzer, said subtractor adapted to receive one or more controlled variables from said data repository, said subtractor generating a primary model error output;
a development error correction analyzer coupled to said data repository and said development primary analyzer error output, said development error correction analyzer adapted to sample said development input vector, said development error correction analyzer estimating a residual between said development primary analyzer output and said controlled variables;	a development error correction analyzer coupled to said data repository and said development primary analyzer error output, said development error correction analyzer adapted to sample said development input vector, said development error correction analyzer estimating a residual between said development primary analyzer output and said controlled variables;

and an adder coupled to the output of said development primary analyzer and said development error correction analyzer, said adder summing the output of said primary and error correction analyzers to estimate said controlled variables.	and an adder coupled to the output of said development primary analyzer and said development error correction analyzer, said adder summing the output of said primary and error correction analyzers to estimate said controlled variables.
Claim 1: an apparatus for modeling a process, said process having one or more disturbance variables as process input conditions, one or more corresponding manipulated variables as process control conditions, and one or more corresponding controlled variables as process output conditions, said apparatus comprising: a data derived primary analyzer adapted to sample an input vector spanning one or more of said disturbance variables and manipulated variables, said data derived primary analyzer generating an output based on said input vector; **a derivative calculator for computing a derivative of the output of**	**Claim 40:** A program storage device having a compute readable program code embodied therein for modeling a process, said process includes one or more disturbance variables as process input conditions, one or more corresponding manipulated variables as process control conditions, and one or more corresponding controlled variables process output conditions, said program storage device comprising: Program code means for generating a set of outputs using a first set of disturbance variables, manipulated variables, and controlled variables as inputs to **a curve fitting algorithm;**

said primary analyzer; **an integrator coupled to the output of said derivative calculator for generating a predicted value;** an error correction analyzer adapted to sample said input vector, said error correction analyzer estimating a residual between said data derived primary analyzer output and said controlled variables; and an adder coupled to the output of said data derived primary analyzer and said error correction analyzer, said adder summing the output of said primary and error correction analyzers to estimate said controlled variables.	Program code means for generating a set of error correction variables using said set of outputs from said primary analyzer and a second set of disturbance variables, manipulated variables, and controlled variables as inputs; and Program code means for generating a set of control variables for modeling said process by summing said set of outputs from said primary analyzer and said set of error correction variables from said error correction analyzer.

Regarding Claims 1, 8 and 40:

The patent does not disclose a curve fitting algorithm.

However, **"Grayson" discloses** a curve fitting algorithm. **(Column 6, Lines 22-24. Back Propagation.)**

It would have been obvious to a person of ordinary skill in the art to utilize a curve fitting algorithm as discussed in **"Grayson"** in conjunction with the primary analyzer and linear model as disclosed in the patent in order to allow for the proper stable mapping of the input variables and for generating a proper output set.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 7-8, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by **Grayson et al. "Process Control Using Neural Network" U.S. Patent # 5,111,531 hereafter referred to as "Grayson."**

Regarding Claims 1:

"Grayson" discloses an apparatus, method, as well as a program storage device having a computer readable program code therein, respectively, for modeling a process, said process includes one or more corresponding manipulated variables as process control conditions, and one or more corresponding controlled variables as process output conditions, said apparatus comprising: **(Column 3, Lines 15-22. Column 14, Lines 10-13)**

a primary analyzer for generating a set of outputs using a first set of disturbance variables, manipulated variables, and controlled variables as inputs to a curve fitting algorithm; **(Column 3, Lines 15-22. Column 6, Lines 22-24. Back Propagation)**

an error correction analyzer, coupled to said primary analyzer, for generating a set of error correction variables using a said set of outputs from said primary analyzer and a second set of disturbance variables, manipulated variables, and controlled variables as inputs; and **(Column 6, Lines 11-19)**

an adder, coupled to said primary analyzer and said error correction analyzer, for generating a set of control variables for modeling said process by summing said set of outputs from said primary analyzer and said set of error correction variables from said error correction analyzer. **(Column 6, Lines 22-24. Back Propagation involves addition to lead to proper estimates of controlled variables)**

Regarding Claim 2:

"Grayson" discloses the apparatus of claim 1, wherein said primary analyzer samples said first set of disturbance variables, manipulated variables, and controlled variables continuously. **(Column 3, Lines 35-36. Column 3, Lines 41-42)**

Regarding Claim 3:

"Grayson" discloses the apparatus of claim 1, wherein said primary analyzer samples said set of disturbance variables, manipulated variables, and controlled variables in predetermined delay periods. **(Column 4, Lines 8-11)**

Regarding Claim 4:

"Grayson" discloses the apparatus of claim 3, wherein said predetermined delay periods are determined by an adaptive process. **(Column 4, Lines 27-29)**

Regarding Claim 5:

"Grayson" discloses the apparatus of claim 3, wherein said predetermined delay periods are user selectable. **(Column 5, Lines 16-20)**

Regarding Claim 7:

"Grayson" discloses the apparatus of claim 1, wherein said disturbance variables and said manipulated variables are latent variables. **(Column 3, Lines 36-41)**

Regarding Claim 8:

"Grayson" discloses the apparatus of claim 1, wherein said curve fitting algorithm is based on a linear model. **(Column 5, Lines 61-64. Column 6, Lines 22-24. Back Propagation)**

Regarding Claim 40:

"Grayson" discloses a program storage device having a compute readable program code embodied therein for modeling a process, said process includes one or more disturbance variables as process input conditions, one or more corresponding manipulated variables as process control conditions, and one or more corresponding

controlled variables process output conditions, said program storage device comprising: **(Column 3, Lines 15-22. Column 14, Lines 10-13. Column 3, Lines 24-34)**

program code means for generating a set of outputs using a first set of disturbance variables, manipulated variables, and controlled variables as inputs to **a curve fitting algorithm; (Column 3, Lines 15-22. Column 6, Lines 22-24. Back Propagation)**

program code means for generating a set of error correction variables using said set of outputs from said primary analyzer and a second set of disturbance variables, manipulated variables, and controlled variables as inputs; and **(Column 6, Lines 11-19)**

program code means for generating a set of control variables for modeling said process by summing said set of outputs from said primary analyzer and said set of error correction variables from said error correction analyzer. **(Column 6, Lines 22-24. Back Propagation involves addition to lead to proper estimates of controlled variables)**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim(s) 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **"Grayson" in view of Lu et al. "Universal Process Control Using Artificial Neural Networks" U.S. Patent No. 5,159,660 hereafter referred to as "Lu."**

Regarding Claim 18:

"Grayson" does not disclose the apparatus of claim 1, wherein said apparatus further includes:

a distributed control system coupled to the output of said adder; and

a run-time delay and variable selector coupled to the output of said distributed control system.

"Lu", however, discloses the apparatus of claim 1, further comprising:

a distributed control system coupled to the output of said adder; **("Lu", Figures 1a/1b, ANN controller)**

and a run-time delay and variable selector coupled to the output of said distributed control system, **("Lu", Column 6, Lines 34-47)**

It would have been obvious to a person of ordinary skill in the art to utilize a distributed control system as well as run-time delay and variable selector as discussed in **"Lu"** in order to allow for the proper utilization and processing of the data discussed in **"Grayson"**

10. Claim(s) 9-11, 14, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **"Grayson" in view of "Lu" as applied to the rejection of claims 1-5, 7-8, and 18 above, further in view of Ham et al. "Inverse Model Formulation of Partial Least Squares Regression: A Robust Neural Network Approach" hereafter referred to as "Ham."**

Regarding Claim 9:

"Grayson" and "Lu" do not disclose the apparatus of claim 8, wherein said linear model is a Partial Least Squares model.

"Ham", however, discloses the apparatus of claim 8, wherein said linear model is a Partial Least Squares model. **("Ham", Page 1, Abstract, Lines 1-3).**

It would have been obvious to a person of ordinary skill in the art to utilize a Partial Least Squares model as discussed in **"Ham"** in order to facilitate the apparatus discussed in "**Grayson" and "Lu"** in order to correctly assess the relationship between variables.

Regarding Claim 10:

"Grayson" discloses the apparatus of claim 9, wherein said apparatus further includes a filter coupled to said primary analyzer for providing a filtered vector as an output. **(Column 4, Lines 17-23)**

Regarding Claim 11:

"Grayson" discloses the apparatus of claim 10, wherein said filter is adaptive. **(Column 4, Lines 27-29)**

Regarding Claim 14:

"Grayson" discloses the apparatus of claim 9, wherein said error correction analyzer is a neural network. **(Column 4, Lines 15-23. Column 6, Lines 11-23)**

Regarding Claim 16:

"Grayson" discloses the apparatus of claim 14, wherein said apparatus further includes a filter coupled to an input of said primary analyzer. **(Column 4, Lines 16-18)**

Regarding Claim 17:

"Grayson" and "Lu" do not disclose the apparatus of claim 9, wherein said error correction analyzer is based on a neural network partial least squares model.

"Ham", however, discloses the apparatus of claim 9, wherein said error correction analyzer is a neural network partial least squares model. **("Ham", Page 1, Abstract, Lines 1-3).**

It would have been obvious to a person of ordinary skill in the art to utilize a Partial Least Squares model as discussed in **"Ham"** in order to facilitate the neural network apparatus discussed in **"Grayson" and "Lu"** in order to correctly assess the relationship between variables and allow proper error correction.

11. Claim(s) 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over **"Grayson" in view of "Lu" further in view of "Ham" as applied to the rejection of claims 9-11, 14, and 16-17 above further in view of Lo "Optimal Filtering by Recurrent Neural Networks" U.S. Patent # 5,408,424 hereafter referred to as "Lo".**

Regarding Claim 12:

"Grayson", "Lu" and "Ham" do not disclose The apparatus of claim 10, wherein said filter is a Kalman filter adapted to receive said controlled variables.

"Lo", however, discloses the apparatus of claim 10, wherein said filter is a Kalman filter adapted to receive said controlled variables. **("Lo", Column 1, Lines 50-54)**

It would have been obvious to one of ordinary skill in the art to utilize a Kalman filter, as discussed in **"Lo"**, in order to filter the elements in the data-derived primary analyzer discussed in **"Grayson", "Lu" and "Ham"** to allow for appropriate controlled variables.

Claim Objections

12. Claims 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, as well as overcoming the double patenting rejection addressed above.

Regarding Claim 19:

Claim 19 discusses "the apparatus of claim 18, wherein said run-time delay and variable selector are adapted to receive delay and variable settings, wherein said primary analyzer and said error correction analyzer are adapted to receive model parameters, said apparatus further comprising:

a data repository for storing historical values of said disturbance variables, said manipulated variables and said controlled variables;

a development delay and variable selector coupled to said data repository for selecting and time-shifting one or more of said disturbance variables, said manipulated variables and said controlled variables, said development delay and variable selector generating said delay and variable settings;

a hybrid development analyzer coupled to said development delay and variable selector, said hybrid development analyzer generating said model parameters."

These highlighted limitations in combination with the other claimed elements and features is not taught nor fairly suggested by the prior art of record.

Regarding Claim 20:

Claim 20 discusses "The apparatus of claim 18, wherein said hybrid development analyzer further comprises:

a development primary analyzer coupled to said data repository, said development primary analyzer adapted to sample a development input vector spanning one or more of said disturbance variables and manipulated variables, said development primary analyzer adapted to sample one or more controlled variables, said development primary analyzer generating an output based on said input vector;

a subtractor coupled to said data repository and to said development primary analyzer, said subtractor adapted to receive one or more controlled

variables from said data repository, said subtractor generating a primary model error output;

a development error correction analyzer coupled to said data repository and said development primary analyzer error output, said development error correction analyzer adapted to sample said development input vector, said development error correction analyzer estimating a residual between said development primary analyzer output and said controlled variables;

and an adder coupled to the output of said development primary analyzer and said development error correction analyzer, said adder summing the output of said primary and error correction analyzers to estimate said controlled variables."

These highlighted limitations in combination with the other claimed elements and features is not taught nor fairly suggested by the prior art of record.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references include:

a) **"NEURAL NETWORKS: A NEW TECHNOLOGY FOR INFORMATION PROCESSING**" Casimir C. "Casey" Klimasauskas, NeuralWare, Sewickley, PA. DATA BASE Spring 1989.

b) **"Defect Prediction With Neural Networks"** Robert L. Stites, Bryan Ward, and Robert V. Walters. 1991 ACM. 089791432-519110005/0199.

c) NeuralWorks Professional II/PLUS software package.

14. Claims 1-5, 7-12, 14, 16-20, and 40 are rejected.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saif A. Alhija whose telephone number is (571) 272-8635. The examiner can normally be reached on M-F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere can be reached on (571) 272-3780. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 30, 2005

JEAN B. HOMERE
PRIMARY EXAMINER